

ABSTRACT

An optical fiber coupling part capable of reducing coupling loss while maintaining a large operating distance, and having a good module assembling property. At least one GRIN lens having numerical aperture NA that is larger than numerical aperture NAs of a light-emitting source (such as a semiconductor laser) is fusion-spliced with one end of the optical fiber. All lights emitted from the light-emitting source can enter the GRIN lens, and the loss of the light can thereby be reduced. In addition, a second GRIN lens having numerical aperture NA<sub>2</sub> is fusion-spliced with one end of the optical fiber having numerical aperture NA<sub>f</sub>, and further a first GRIN lens having numerical aperture NA<sub>1</sub>, which is larger than numerical aperture NA<sub>2</sub>, is fusion-spliced with the other end of the second GRIN lens. Thereby, the light emitted from the light-emitting source can efficiently enter the optical fiber, and loss of the light can thereby be reduced. In this case, the formula expressed by  $NA_f \leq NA_2 < NA_s \leq NA_1$  is desirable.